Practical Tools for Managers of Smaller Projects

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Regardless of career field or program affiliation, nearly all defense employees are project managers of sorts. After all, projects are unique endeavors of limited duration, directed at achieving a specific result. Some projects are large and complex; however, many are much smaller.

This article will introduce you to several practical project management tools that managers of smaller projects can effectively use to increase the likelihood that their projects will be successful. Most lend themselves nicely to a team approach, and none requires expensive or complicated project management software to implement.

Project Selection

As managers, we spend a fair amount of time analyzing the programs under our cognizance. In so doing, we conceptualize projects we think will improve our programs in some way. Sometimes our list of potential projects grows fairly long. Almost always, our ability to implement multiple projects simultaneously is hindered by the resource constraints so characteristic of today's defense environment. So how do we prioritize among these projects?

Selection Tool # 1: Project Aspect Comparison Grids

Project Aspect Comparison Grids allow you to examine the merits of potential projects based on multiple dimensions. Here's how to use this tool and to interpret the results:

- **Step 1**: Develop a list of project aspects that you consider to be important. The aspects that you choose will be subjected to a qualitative cost-benefit analysis. Be sure to clearly define and document each of your aspects.
- **Step 2**: Indicate the expected degree of costs and benefits associated with each project aspect by placing an "X" in the appropriate box in the grids that appear in Figure 1. In theory, an "X" placed on or above the shaded diagonal cells indicates a supportable rating for that particular aspect.
- **Step 3**: Prioritize by comparing the completed grids of each project.

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Selection Tool # 2: Pairwise Ranking

Pairwise Ranking can be used to order your potential projects or, for that matter, any list of options that you want to prioritize. Consult pages 108 and 109 of the *DAU Program Manager's Tool Kit* at <www.dau.mil/pubs/misc/toolkit.asp> for an explanation of how to use pairwise ranking. Be sure to develop (and document) a clear definition of project attractiveness when using this tool.

Project Planning

Now that you've selected which project you're going to pursue first, how do you increase the chances of completing this project successfully on the initial attempt (i.e., with little or no rework)?

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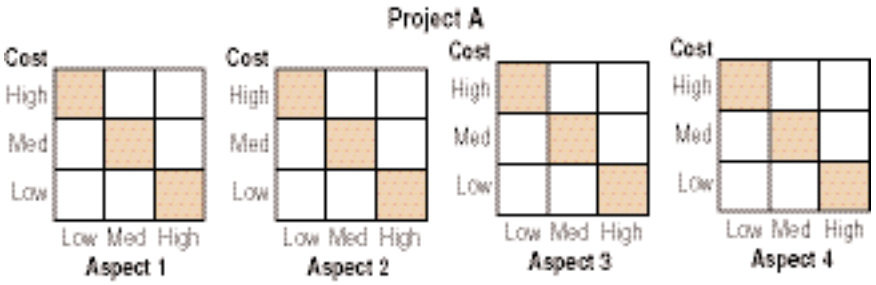
FIGURE 1. Project Aspect Comparison Grids



Use as many grids as necessary to accommodate all projects and associated aspects.

Planning Tool # 1: Approach/Customer Needs Alignment Aid

The Approach/Customer Needs Alignment Aid allows you to pinpoint and prioritize customer requirements. From there, you can select the project approach that best addresses your customer's collective needs. Instructions for using this tool are embedded in Figure 2. Note, though, that the basic process consists of identifying as many customer needs as possible, quantifying how important each is to your customer, and determining how well each of the project approaches that you're considering addresses your customer's collective needs.

Planning Tool # 2: Approach/Potential Problem Alignment Aid

The Approach/Potential Problem Alignment Aid assists you in identifying things that could go wrong with your intended project approach and in modifying it in a fashion that best mitigates/eliminates the chances of these potential problems negatively impacting your project. Instructions for using this tool are embedded in Figure 3. The basic approach consists of identifying as many things that could go wrong with your intended approach as possible, quantifying the seriousness associated with each scenario (were it to be realized), and determining how well proposed modifications to your approach address the potential problems as viewed collectively.

Planning Tool # 3: Program Evaluation and Review Technique (PERT) for Estimating

The PERT estimation method allows you to quickly estimate project costs and durations. The formula is as follows:

$$\frac{\text{worst case estimate} + 4\,(\text{most likely estimate}) + \text{best case estimate}}{6}$$

If you want your estimate to lean toward the conservative side, use a smaller number in the denominator.

Project Control

Now that you've defined your approach and begun to implement it, how do you track expenditures and progress against cost and schedule baselines?

Control Tool # 1: Cumulative Cost Curve

The cumulative cost curve, sometimes referred to as the s-curve, provides a graphical comparison between your project budget and your actual expenditures. Here's how to create and interpret a cumulative cost curve:

- **Step 1**: Create a graph with the vertical axis labeled "dollars" and the horizontal axis labeled "time."
- **Step 2**: Plot your budget data on the graph that you created in step 1 above.
- **Step 3**: As your project progresses, plot (in a different color) your actual expenditures on the same graph.
- **Step 4**: Choose a point in time to examine. If your actual expenditures line for that point in time lies *below* your budget line, then you're under budget. If your actual expenditures line *overlaps* your budget line, then you're within budget. If your actual expenditures line lies *above* your budget line, then you've exceeded your budget.

FIGURE 2. Approach/Customer Needs Alignment Aid

		APPROACHES
Customer need	Importance of need to customer	Approach 1 Type Approach 1 here.
Type customer need 1 here.	Rate high to low using the scale 10 - 1. 10 signifies that need is of utmost importance to customer. 1 signifies that need is of minimal importance to customer. Type rating here.	How well does Approach 1 address customer need 1? Rate high to low using the scale 10 - 1. 10 signifies that approach entirely addresses customer need. 1 signifies that approach minimally addresses customer need. Type rating here. *Importance of need 1 to customer multiplied by how well Approach 1 addresses customer need 1. Type product here.
Type customer need 2 here.	Rate high to low using the scale 10 - 1. Type rating here.	How well does approach 1 address customer need 2? Rate high to low using the scale 10 - 1. Type rating here. *Importance of need 2 to customer multiplied by how well Approach 1 addresses customer need 2. Type product here.
How well does each approach satisfy customer needs (viewed collectively)?		Type sum of starred boxes ("Importance") that appear under the Approach 1 column.
Approach selection criteria:		Approach with the highest sum best satisfies customer needs (viewed collectively).

Repeat form as necessary to accommodate all needs and approaches.

FIGURE 3. **Approach/Potential Problem Alignment Aid**

		CONCERN MITIGATION/ ELIMINATION ACTIONS
What can go wrong/ concerns?	Seriousness (if realized)	Action 1 Type Action 1 here.
Type problem/ concern 1 here.	Rate high to low using the scale 10 - 1. 10 signifies serious negative impact to project. 1 signifies minimal impact to project. Type rating here.	How well does Action 1 address problem/concern 1? Rate high to low using the scale 10 - 1. 10 signifies that action greatly mitigates or eliminates problem/concern. 1 signifies that action minimally addresses problem/concern. Type rating here. *Seriousness of problem/concern 1, if realized, multiplied by how well action 1 addresses problem/concern 1. Type product here.
Type problem/ concern 2 here.	Rate high to low using the scale 10 - 1. Type rating here.	How well does Action 1 address problem/concern 2? Rate high to low using the scale 10 - 1. Type rating here. *Seriousness of problem/concern 2, if realized, multiplied by how well Action 1 addresses problem/concern 2. Type product here.
How well does each action address the problems/concerns (viewed collectively)?		Type sum of starred boxes ("Seriousness") that appear under the Action 1 column.
Approach selection criteria:		Approach with the highest sum best addresses the problems/concerns (viewed collectively).

Repeat form as necessary to accommodate all problems and potential actions.

Control Tool # 2: Basic Gantt Chart

For each project task/subtask, the basic Gantt Chart provides a graphical comparison between your baseline schedule and your actual, realized progress. You'll find instructions on page 119 of the *Program Manager's Tool Kit*.

Control Tool # 3: Earned Value Management

Sometimes, because of project size or complexity, it becomes difficult to ascertain—using only the cumulative cost curve and the basic Gantt chart—where your project stands with regard to cost and schedule baselines. By measuring work effort in terms of dollars, Earned Value Management provides an integrated perspective of both cost and schedule performance. At first glance, EVM may appear to be difficult to comprehend. The reality, however, is that EVM is composed of just three basic building blocks:

- **Actual Cost**: AC indicates how much you actually spent to do the work you actually accomplished (formerly referred to as Actual Cost of Work Performed).
- **Earned Value**: EV is the dollar value of the work that you actually did (formerly Budgeted Cost of Work Performed).
- **Planned Value**: PV is the dollar value of the work that you were supposed to do. In essence, it is your baseline plan or target (formerly Budgeted Cost of Work Scheduled).

Using these three basic building blocks, you can make a variety of calculations that provide insight into how well your project is progressing in relation to your cost and schedule baselines.

Here are some of the more useful EVM calculations:

- **Cost Variance**: CV is a comparison between how much you actually spent to do the work (your AC) and the dollar value of the work accomplished (your EV). You want your CV to be equal to or greater than 0. Calculation: EV – AC = CV.
- **Cost Performance Index**: CPI can be thought of as spending efficiency. You want your CPI to be equal to or greater than 1. Calculation: EV/AC = CPI.
- **Schedule Variance**: SV is a comparison between the dollar value of the work that you were supposed to do (your PV) and the dollar value of the work that you actually did (your EV). You want your SV to be equal to or greater than 0. Calculation: EV – PV = SV.
- **Schedule Performance Index**: SPI is essentially a measure of work efficiency. It provides insight into what portion of the planned effort you actually achieved. You want your SPI to be equal to or greater than 1. Calculation: EV/PV = SPI.
- **Critical Ratio CR**: CR is an overall measure of your performance. You want your CR to be equal to or greater than 1. Calculation: CPI x SPI = CR.

Project Closeout

You've completed all of the steps in your project plan. Is your project finished? Yes and no. It's always a good idea to look back upon your project as it developed throughout its life cycle and to document lessons learned. This will provide you and your coworkers with a written record of issues that surfaced, insight into why they arose, and how they were resolved. The information can prove useful as you and your teammates move on to future project management endeavors.

Project management tools don't have to be overly complicated to be effective. Consider using some or all of the tools discussed in this article on the next small project assigned to you, and you'll increase the likelihood of successful completion.

The author welcomes comments and questions. Contact him at brad.hierstetter@navy.mil.